

Michigan Public Service Commission Renewable Energy Overview

2012 GLREA Energy Fair

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Any views expressed are my own and not necessarily that of the Michigan Public Service Commission



MICHIGAN PUBLIC SERVICE COMMISSION

Overview

- February 15, 2012 Report
 - Includes 2011 data from 82 electric providers
- Highlights of 2011 Detroit Edison and Consumers Energy Renewable Plan Filings



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Michigan Renewable Energy Standard Public Act 295 of 2008

- 10% renewable energy standard (RPS) by 2015, with interim steps for 2012-13-14.



CLEAN, RENEWABLE, AND EFFICIENT ENERGY ACT Act 295 of 2008

AN ACT to require certain providers of electric service to establish renewable energy programs; to require certain providers of electric or natural gas service to establish energy optimization programs; to authorize the use of certain energy systems to meet the requirements of those programs; to provide for the approval of energy optimization service companies; to provide for certain charges on electric and natural gas bills; to promote energy conservation by state agencies and the public; to create a wind energy resource zone board and provide for its power and duties; to authorize the creation and implementation of wind energy resource zones; to provide for expedited transmission line siting certificates; to provide for a net metering program and the responsibilities of certain providers of electric service and customers with respect to net metering; to provide for fees; to prescribe the powers and duties of certain state agencies and officials; to require the promulgation of rules and the issuance of orders; and to provide for civil sanctions, remedies, and penalties.

History: 2008, Act 295, Imd. Eff. Oct. 6, 2008.

Compiler's note: Enacting section 1 of Act 295 of 2008 provides: "Enacting section 1. As provided in section 5 of 1846 RS 1, MCL 8.5, this act is severable."

The People of the State of Michigan enact:

PART 1. GENERAL PROVISIONS

460.1001 Short title; purpose of act.

Sec. 1. (1) This act shall be known and may be cited as the "clean, renewable, and efficient energy act".

(2) The purpose of this act is to promote the development of clean energy, renewable energy, and energy optimization through the implementation of a clean, renewable, and energy efficient standard that will cost-effectively do all of the following:

- (a) Diversify the resources used to reliably meet the energy needs of consumers in this state.
- (b) Provide greater energy security through the use of indigenous energy resources available within the state.
- (c) Encourage private investment in renewable energy and energy efficiency.
- (d) Provide improved air quality and other benefits to energy consumers and citizens of this state.

History: 2008, Act 295, Imd. Eff. Oct. 6, 2008.

Compiler's note: Enacting section 1 of Act 295 of 2008 provides: "Enacting section 1. As provided in section 5 of 1846 RS 1, MCL 8.5, this act is severable."

460.1003 Definitions; A to C.

Sec. 3. As used in this act:

- (a) "Advanced cleaner energy" means electricity generated using an advanced cleaner energy system.
- (b) "Advanced cleaner energy credit" means a credit certified under section 43 that represents generated advanced cleaner energy.
- (c) "Advanced cleaner energy system" means any of the following:
 - (i) A gasification facility.
 - (ii) An industrial cogeneration facility.
 - (iii) A coal-fired electric generating facility if 85% or more of the carbon dioxide emissions are captured and permanently geologically sequestered.
 - (iv) An electric generating facility or system that uses technologies not in commercial operation on the effective date of this act.
- (d) "Affiliated transmission company" means that term as defined in the electric transmission line certification act, 1995 PA 30, MCL 460.562.
- (e) "Applicable regional transmission organization" means a nonprofit, member-based organization governed by an independent board of directors that serves as the federal energy regulatory commission-approved regional transmission organization with oversight responsibility for the region that includes the provider's service territory.
- (f) "Biomass" means any organic matter that is not derived from fossil fuels, that can be converted to usable fuel for the production of energy, and that replenishes over a human, not a geological, time frame, including, but not limited to, all of the following:
 - (i) Agricultural crops and crop wastes.

Rendered Tuesday, February 17, 2009

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Michigan Compiled Laws Complete Through PA 586 of 2008

Courtesy of www.legislature.mi.gov



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- 2008 PA 295, cited as the Clean, Renewable and Efficient Energy Act (Act), requires Michigan electric providers to provide customers with at least ten percent of their electricity from renewable energy sources by 2015.
- Electric providers will meet these requirements through the purchase and/or production of Renewable Energy Credits (RECs).
- <http://www.legislature.mi.gov/documents/2007-2008/publicact/pdf/2008-PA-0295.pdf>



February 15, 2012 Renewable Energy Report

- Sec. 51(5): By February 15, 2011 and each year thereafter, the commission shall submit to the [legislators] ... a report that does all of the following:
 - (a) Summarizes data collected under this section.
 - (b) Discusses the status of renewable energy and advanced cleaner energy in this state and the effect of this subpart and subpart B on electricity prices.
 - (c) ... specifies the difference between the cost of the renewable energy and the cost of electricity generated from new conventional coal-fired electric generating facilities.
 - (d) Discusses how the commission is fulfilling the requirements of subsection (4) (annual reports).
 - And...



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February 15, 2012 Renewable Energy Report

- (e) Evaluates whether this subpart has been cost-effective.
- (f) Provides a comparison of the cost effectiveness of the methods of an electric utility with 1,000,000 or more retail customers in this state as of January 1, 2008 obtaining renewable energy credits under the options described in section 33 (self build vs PPA).
- (g) Describes the impact of this subpart on employment in this state.
- (h) Describes the effect of the percentage limits under section 27(7) on the development of advanced cleaner energy (10% ACEC limit).
- (i) Makes any recommendations the commission may have concerning amendments to this subpart...



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- 66 Biennial Renewable Energy Plans approved in 2011
- 2 Initial Renewable Energy Plans approved in 2011
- 11 Biennial Plans and 1 Amended Plan were still pending approval at the end of 2011



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- Rate regulated Electric Providers required to submit RE reconciliations to consider the reasonableness and prudence of expenses and amounts collected through the surcharge
 - 14 in total for the 2010 plan year
 - 6 Cooperatives
 - 8 Investor Owned Utilities
 - Alternative Electric Suppliers and Municipals not required to submit

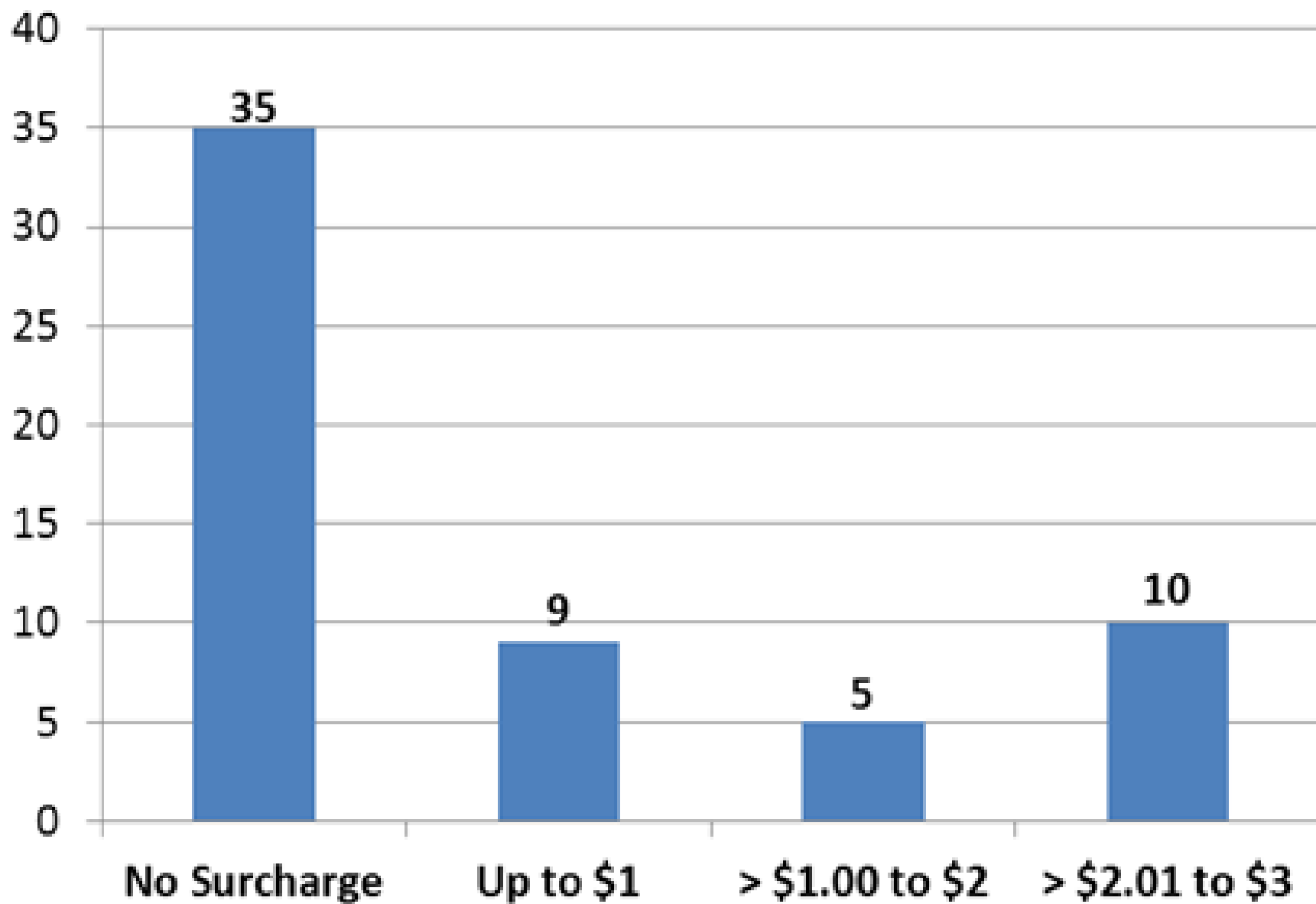


Surcharge Caps

- Section 45 of 2008 PA 295 caps renewable energy surcharges by customer class:
 - \$3.00 per month per residential meter
 - \$16.58 per month per commercial meter
 - \$187.50 per month per industrial meter



of Electric Providers



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- Three expected not to achieve the 10% requirement due to surcharge caps
 1. City of Eaton Rapids
 2. Detroit Public Lighting
 3. Wisconsin Electric Power Co.Combined they make up less than 4% of Michigan's retail electric load



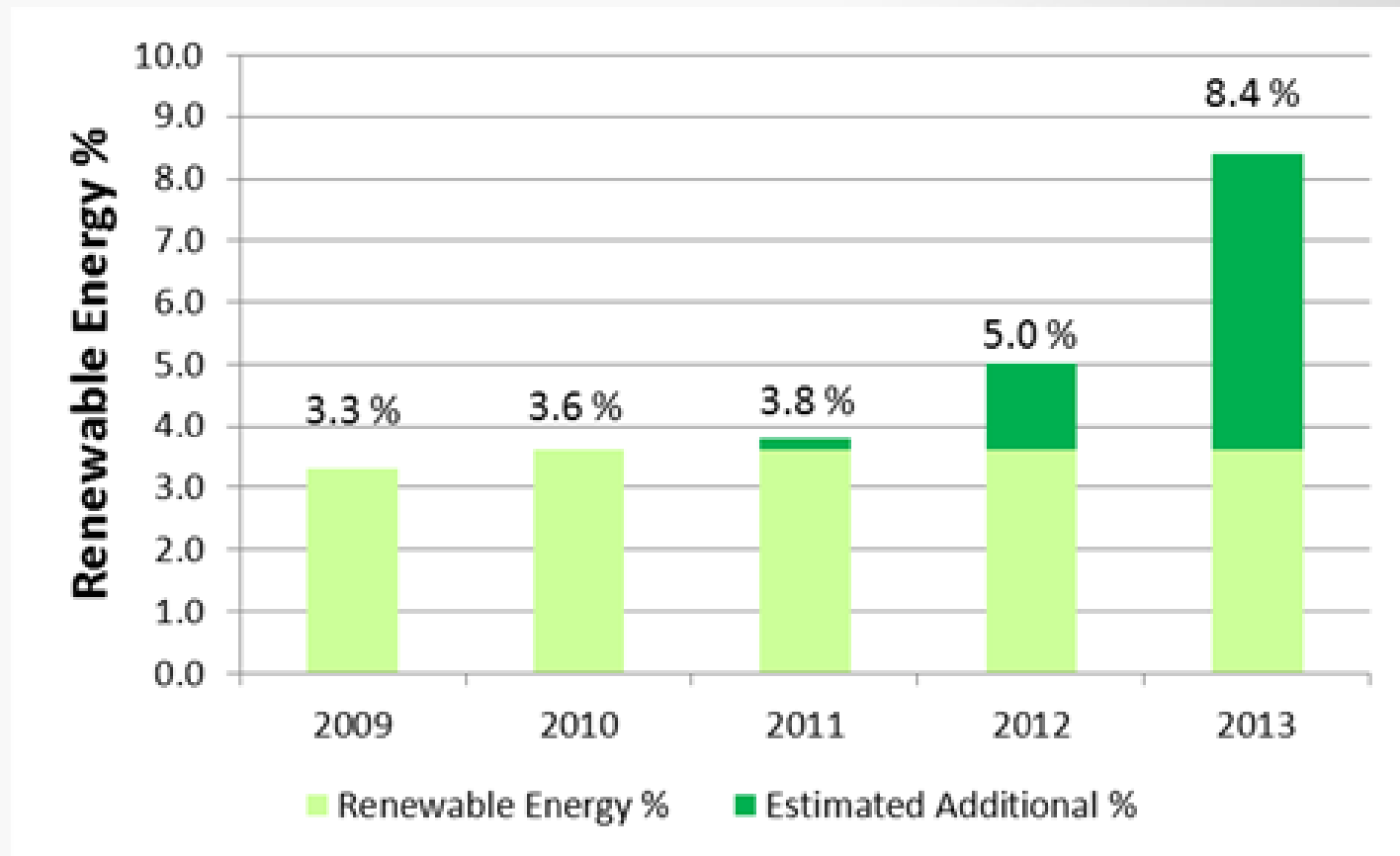
February 15, 2012 Report

- 2007 renewable energy percentage was 2.9%
- Annual report data shows that Michigan's 2009 renewable energy percentage was 3.3% and 3.6% in 2010
- We estimate that approximately 1041 MW of new renewables will be commercially operational by the end of 2013 for approximately 8.4%
- By 2015 the Act requires 10% of the electricity to come from renewable resources



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Estimated and Projected Renewable Energy Percentage Based on Act 295 Contracts Filed at the Commission



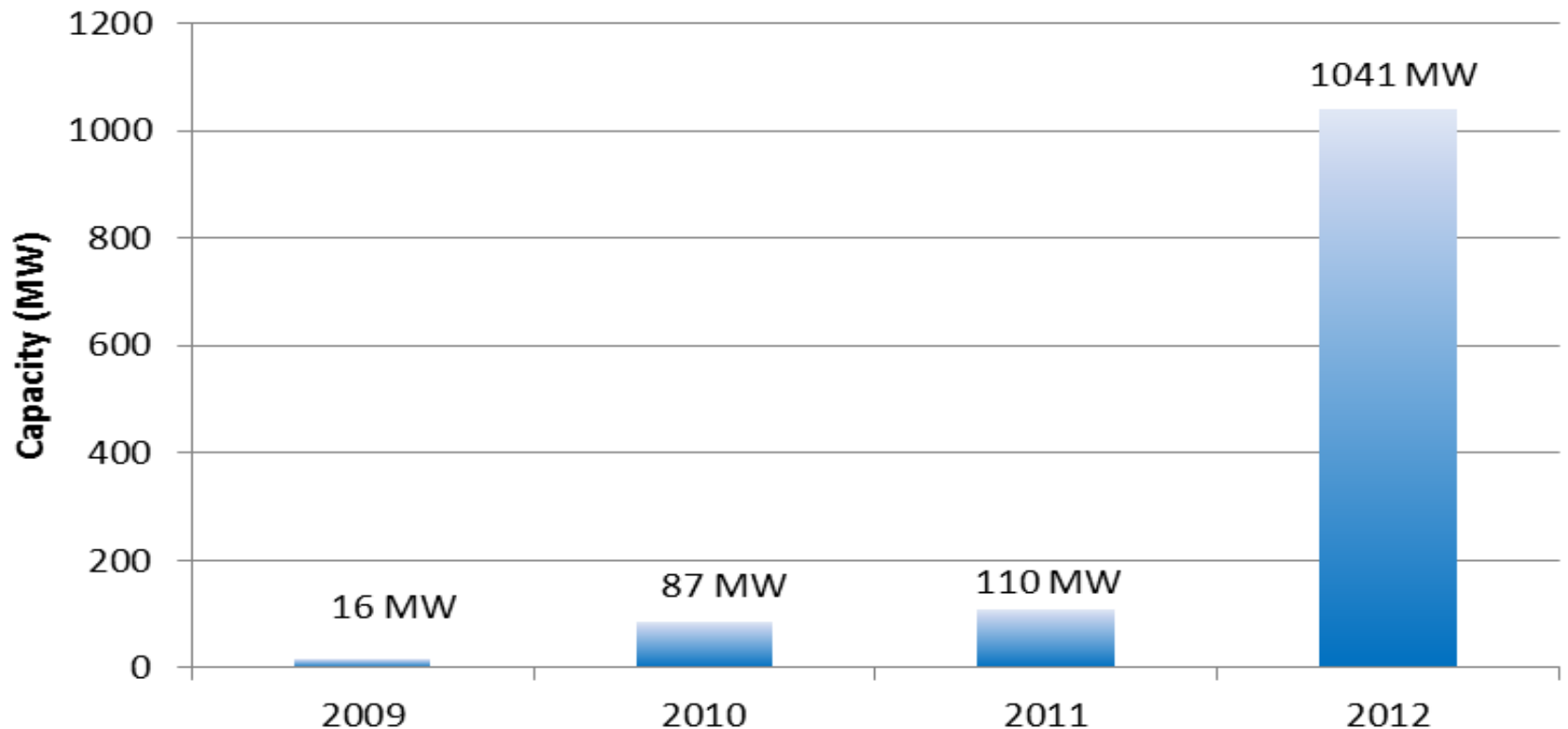
Source: Electric Provider Annual Reports and Act 295 Renewable Energy Contracts



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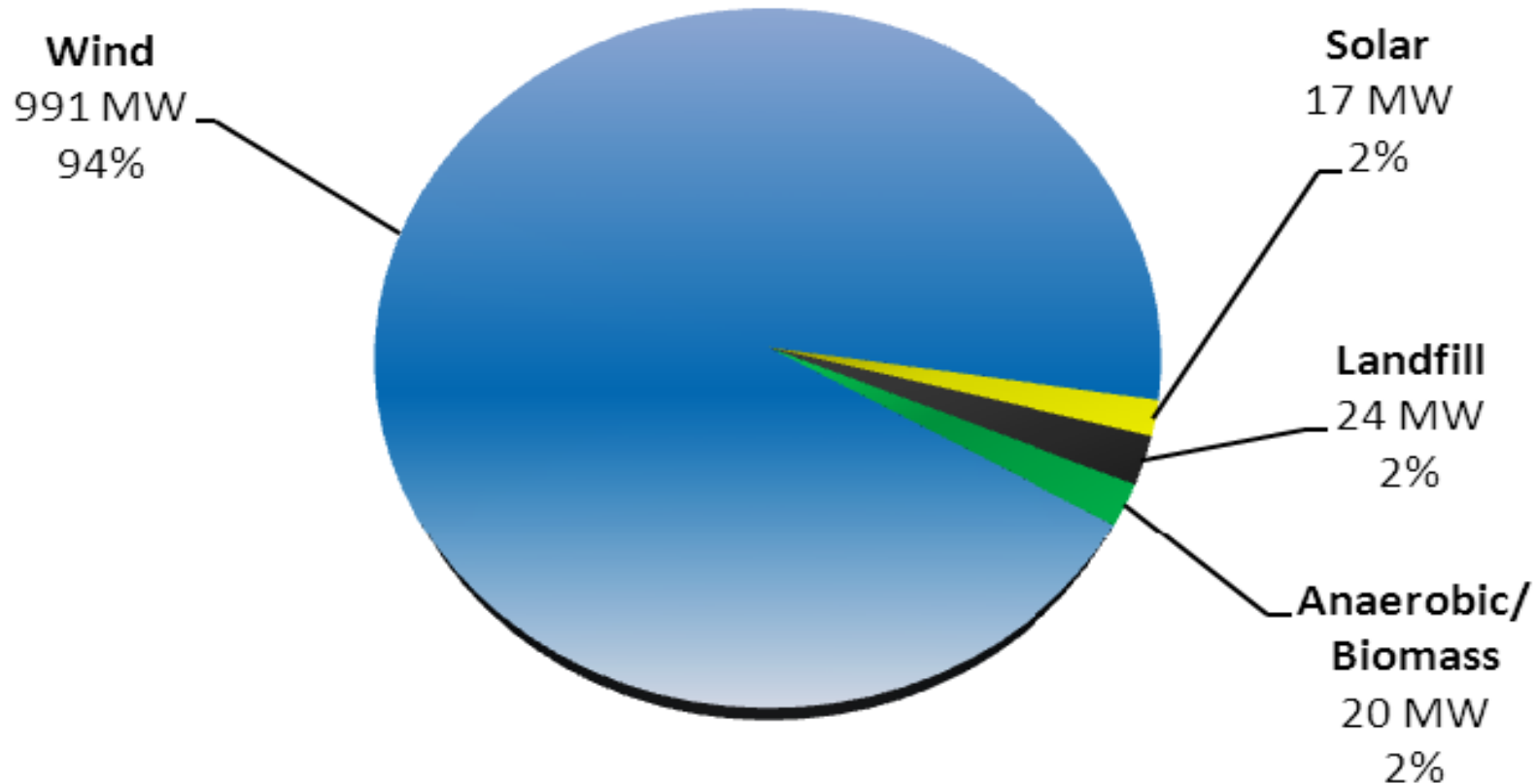
Cumulative New Renewable Energy Capacity and Commercial Operation Dates

Total New Capacity by Year



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New Renewable Capacity by Technology Type



Includes all renewable energy contracts approved by the MPSC from 2009 - 2011.
Includes 12 MW of Solar that will come online through 2015.
Source: Electric provider contract approval filings.



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- Detroit Edison SolarCurrents Pilot Program
 - Customer-owned Program size of 5 MW
 - At least half reserved for residential customers
 - System size limited to between 1 and 20 kW
 - Contract term of 20 years
 - Through pre-payment and purchase of RECs, company will pay \$2.40/watt up-front with an ongoing payment of \$0.11/kWh (~half of the installed cost).
 - Add-on to net metering; only category 1 net metering systems qualify (20 kW or less).
 - Fully Subscribed as of May 2011
 - Company-owned program size of 15 MW
 - Projects range from 60 kW to just over 500 kW
 - Company owns the system and pays participants easement payments over 20 years
 - Currently there are eight projects installed that total just under 3 MW
- Company has discussed the possibility of a customer-owned expansion
 - Announcement should come 3rd quarter of 2012



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- Consumers Energy's Expanded Solar Experimental Advanced Renewable Program
- Significantly redesigned from original program (Phase 1 and 2)
 - 3.25 MW additional capacity (5.25 MW total)
 - Contract term of up to 15 years
 - Limited capacity in each Phase chosen by lottery
 - Dynamic Price range: \$0.20-\$0.26/kWh
 - (June 2013 marks the elimination of price floor)
 - Phase 1 – \$0.525-\$0.65/kWh
 - Phase 2 - \$0.375-\$0.45/kWh
 - Currently on Phase 7 (residential \$0.249/kWh)
 - All previous Phases have gone to lottery



Consumers Energy : Contracts

Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
Blissfield Wind	Unchanged from original contract	Unchanged from original contract	20 Years	Wind	Amendment	01/26/2012	12/31/2012
Heritage Garden Wind Farm I	20 MW	Unchanged from original contract	20 Years	Wind	Amendment	01/26/2012	12/31/2012
Heritage Stony Corners Wind Farm II	Unchanged from original contract	Unchanged from original contract	20 Years	Wind	Amendment	01/26/2012	1/1/2012
Heritage Stony Corners Wind Farm I (Phase 3)	8.35 MW	\$106.20 MWh	20 Years	Wind	Result of Amendments	01/26/2012	1/1/2012
Experimental Advanced Renewable Program	987.7 KW	Commercial \$0.375/KWh Residential \$0.525/KWh	12 Years	Solar	Unsolicited	05/10/2011	5/1/2011
Vestas-American Wind Technology	56 V100 1.8 MW Turbines	\$110.00/MWh	Company Owned	Wind	1/15/2010	12/2/2010	12/31/2012
White Construction, Inc. U-15805 edocket files # 251-256	Installation and construction				7/23/2010		
GE Prolec Transformers, Inc.	2-125 KV transformers				7/27/2009		
Heritage Garden Wind Farm I	28.6 MW	\$106.20 MWh	20 Years	Wind	Unsolicited	11/19/2010	1/1/2012
Heritage Stony Corners Wind Farm II	12.3 MW	\$98.50 MWh	20 Years	Wind	Unsolicited	11/19/2010	1/1/2012
Experimental Advanced Renewable Program	Commercial 836.6 KW Residential 200.1 KW	Commercial \$0.45/KWh Residential \$0.65/KWh	12 Years	Solar	Unsolicited	12/21/2010	5/1/2010
Scenic View Dairy**	0.35 MW	\$83.07/MWh	63 Months	Anaerobic	Unsolicited	10/26/2010	7/29/2010
Blissfield Wind	81 MW	\$100.88/MWh	20 Years	Wind	5/7/2009	7/27/2010	12/31/2012
Harvest II Wind	59.4 MW	\$98.38/MWh	20 Years	Wind	5/7/2009	7/27/2010	12/31/2012
Michigan Wind 2	90 MW	\$94.00/MWh	20 Years	Wind	5/7/2009	7/27/2010	6/30/2012
WM Renewable Energy - Pine Tree Acres	12.8 MW	\$98.75/MWh	20 Years	Landfill Gas	5/7/2009	7/27/2010	6/30/2012
WM Renewable Energy - Northern Oaks Landfill	1.6 MW	\$122.39/MWh	20 Years	Landfill Gas	1/29/2009	10/13/2009	11/11/2010
NANR - Lennon	1.6 MW	\$137.27/MWh	20 Years	Landfill Gas	1/29/2009	10/13/2009	12/31/2010
Elk Rapids Hydro Electric** 1	0.7 MW	\$121.31/MWh	10 Years	Hydro	1/29/2009	10/13/2009	7/11/2009
Zeeland**	1.6 MW	\$122.20/MWh	7 Years	Landfill Gas	1/29/2009	10/13/2009	7/11/2009
Freemont Community Digester	3.1 MW	\$139.35/MWh	20 Years	Anaerobic	1/29/2009	10/13/2009	11/11/2012
Scenic View Dairy** 1, 2	0.82 MW	\$138.17/MWh	7 Years	Anaerobic	1/29/2009	10/13/2009	7/11/2009
Total	397 MW						

Detroit Edison Company : Contracts

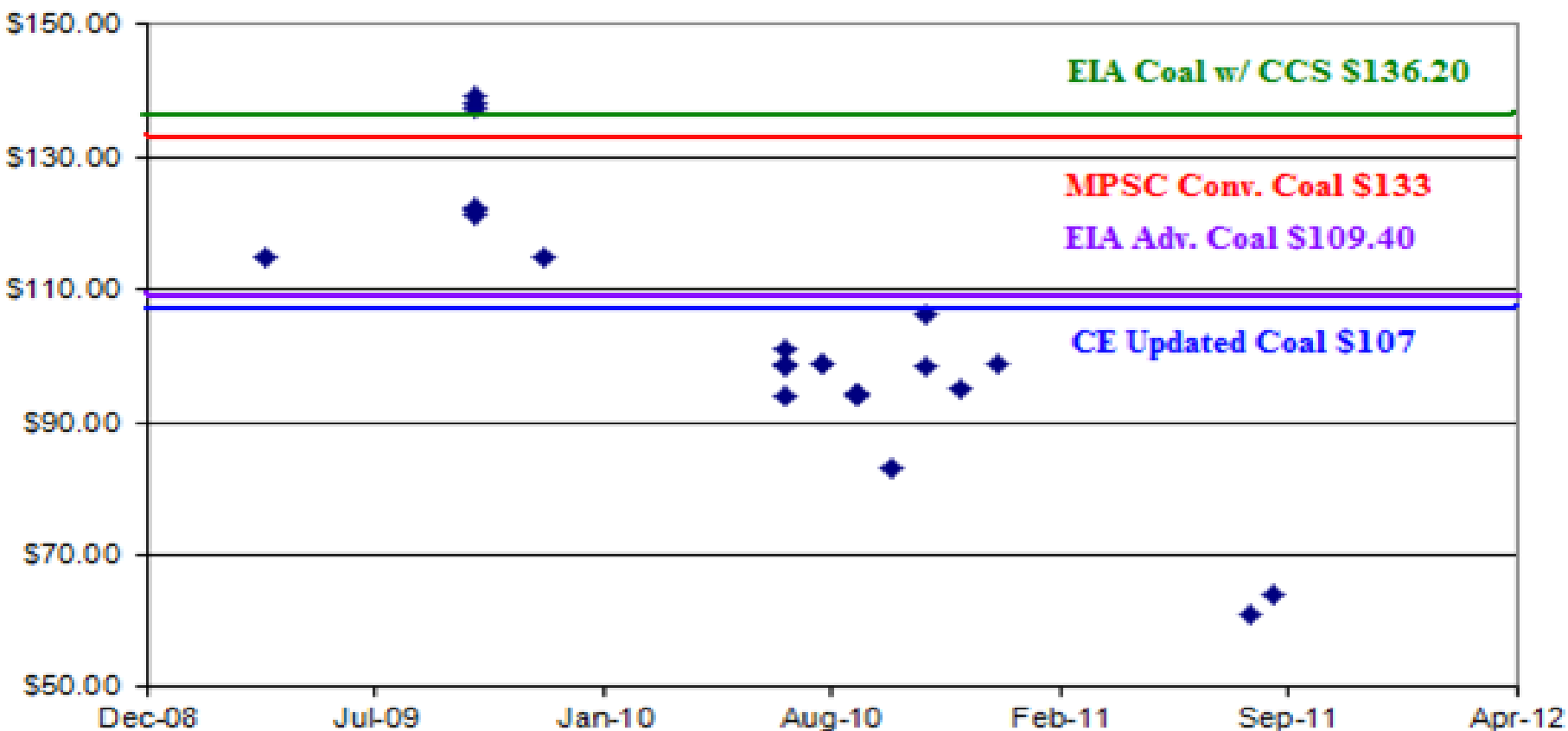
Seller	Quantity	Cost*	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
Michigan Waste Energy, Inc.	Up to 65,000 RECs/Year	\$7.00/REC	13 Years	Incinerator	Unsolicited	12/6/2012	1991
Nova Consultants, Inc.	Solar EPC	Up to \$48 Million	Company Owned	Solar	2/28/2011	11/10/2011	12/31/2015
McNaughton-McKay Electric Company	Supply up to 12 MW of Modules	Up to \$24 Million			3/24/2011		
Inovatus Solar, LLC	Supply up to 12MW						
General Electric Company	Up to 69.16MW-100 Turbines	\$61-\$64/MWh	Company Owned	Wind	3/9/2011	9/13/2011	12/31/2012
Barton Malow Company	Installation and construction				5/6/2011		
Tuscola Bay Wind, LLC	120 MW	Up to \$60.90/MWh	20 Years	Wind	11/18/2010	8/25/2011	10/31/2012
L'Anse Warden Electric Company	110,374 RECs	\$11.98 (Average of 4 REC/ACEC Contracts)	Amendment Acquiring Vintage RECs	Biomass	8/18/2009	8/25/2011	7/1/2010
Gratiot County Wind	12.8 MW additional	Unchanged from original contract	Company Owned	Wind	Amendment	5/10/2011	12/31/2012
Nova Consultants	Unchanged from original contract	Unchanged from original contract	Company Owned	Solar	Extension	12/21/2010	12/31/2011
Blue Water Renewables - Smiths Creek Landfill	3.2 MW	\$99.00/MWh	20 Years	Landfill	Unsolicited	1/20/2011	12/31/2011
Gratiot County Wind	110.4 MW	Up to \$94.43/MWh Price not available	20 Years	Wind	8/18/2009	9/14/2010	05/1/2012
	89.6 MW Company Owned		Company Owned				03/31/2012
WM Renewable Energy - Eagle Valley Landfill	3.2 MW	Combined average price of \$98.94/MWh	20 years	Landfill	8/18/2009	8/10/2010	6/1/2011
L'Anse Warden Electric Company	17 MW		20 years	Biomass	8/18/2009	8/10/2010	7/1/2010
Boyce Hydro**	Firm 210,000 RECs w/additional 112,000 RECs dependent on generation	\$7.75/ REC					
			7 Years	Hydro	12/23/2009	4/27/2010	3/16/2010
Nova Consultants	Up to 3 MW	Up to \$18 Million	Company Owned	Solar	11/23/2009	3/2/2010	12/31/2010
Heritage Sustainable Energy Stoney Corners Wind Farm	12.2 MW	Unchanged from original contract	20 Years	Wind	Unsolicited	12/1/2009	1/1/2011
UPPCO**	Firm 500,000 RECs	Combined average price of \$12.46/REC	7 Years	Hydro	12/23/2009	12/1/2009	10/1/2009
Sterling Planet**	Firm 2,500,000 RECs		10 Years	MISC	12/23/2009	12/1/2009	10/1/2009
Heritage Sustainable Energy Stoney Corners Wind Farm	14 MW	\$115.00/MWh	20 Years	Wind	Unsolicited	4/30/2009	12/21/2009
Total	507.8MW						

Alpena Power Company : Contracts							
Seller	Quantity	Cost	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
Consumers Energy	"Bulk of RECs needed to meet the RPS"	\$30.37/REC (estimated)	20 Years	MISC	Unsolicited	9/15/2009	8/4/2009
AEP/Indiana Michigan : Contracts							
Seller	Quantity	Cost	Term	Renewable Energy Type	Request for Proposal	Commission Approval	Commercial Operation Date
Fowler Ridge Wind Farm II	50 MW	Redacted	20 Years	Wind	Unsolicited	9/15/2009	2/15/2010
Wildcat I Wind Farm, LLC	100 MW	Redacted	20 years	Wind	Competitive Solicitation	8/25/2011	12/31/12



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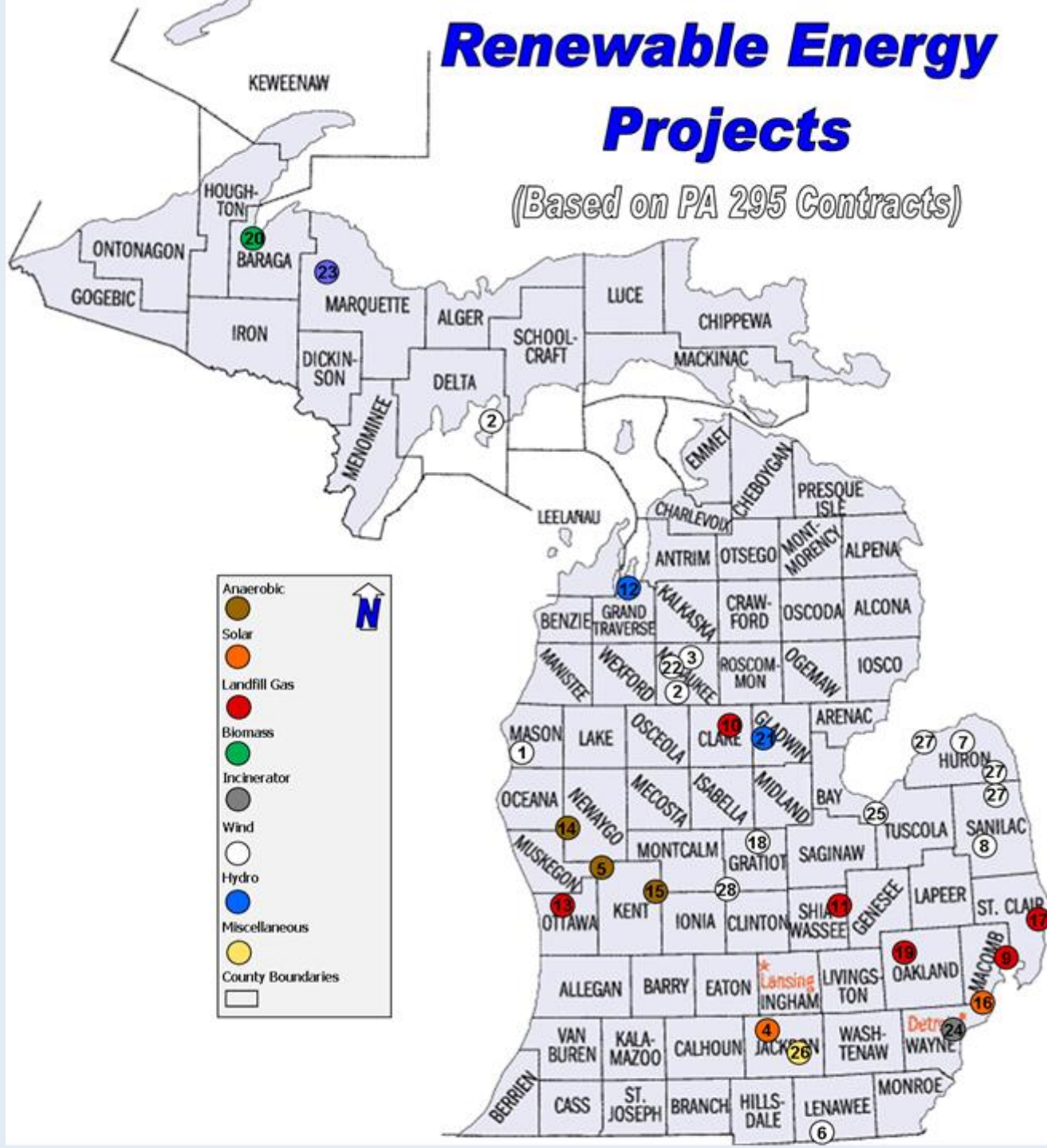
Levelized Cost of MPSC Approved Contracts Over Time Compared to the Cost of New Coal Fired Facilities (\$ per MWh)



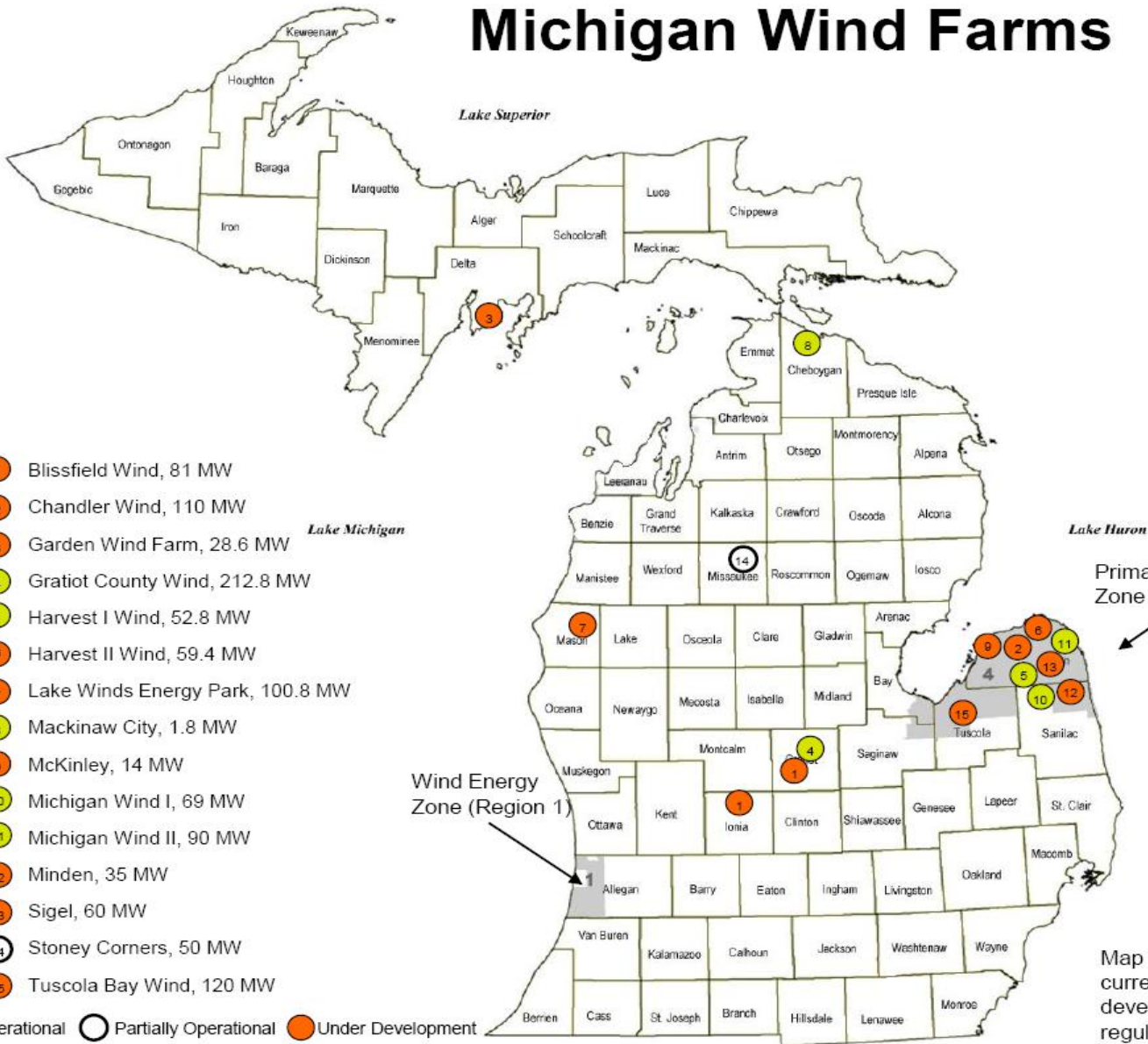
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Renewable Energy Projects

(Based on PA 295 Contracts)



Michigan Wind Farms



Map includes wind farms currently operating or under development for MPSC rate-regulated electric providers.



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Average Levelized Renewable Energy Contract Prices for Consumers Energy and Detroit Edison 2009 - 2011

Consumers Energy

Technology	Wind	Anaerobic Digester	Biomass	Landfill Gas	Hydro
Average	\$101.33	\$120.20	--	\$120.15	\$121.31

Detroit Edison

Technology	Wind	Anaerobic Digester	Biomass	Landfill Gas	Hydro
Average	\$87.20	--	\$98.94	\$98.97	--

Combined Average	\$94.27	\$120.20	\$98.94	\$109.56	\$121.31
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Cost of 2008 PA 295

Weighted Average Cost Based on Lifecycle MWh

Energy Optimization

\$15.82

Renewable Energy

\$91.19

Combined

\$61.19



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- Renewable Energy and Energy Optimization Effect on Market Electricity Prices

“With the renewable energy and energy optimization programs just ramping up, no impacts on price have been quantified at this point.”

“Throughout the MISO footprint, increased growth in wind has acted to displace relatively high cost generation, resulting in lower cost base-load plants more frequently setting the margin.”



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10% Renewable Energy Standard's Impact on Employment

Incentive	Incentive Renewable Energy Credits	Renewable Resource (Number of Generators) ¹	Generator Capacity
Michigan Equipment	974	Wind (1), Solar (1), Biomass (2)	47 MW
Michigan Labor	122,831	Landfill Gas (8), Wind (6), Biomass (3), Solar (7)	223.16 MW
¹ The four generators eligible for Michigan Equipment IRECs are also eligible for the Michigan Labor IRECs.			



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Recommendations on amendments to the Act:

- Only require rate-regulated electric providers with surcharges to file yearly Renewable Cost Reconciliations.
- If the electric provider is on track to meeting compliance, they do not need to file a Biennial REP. Detroit Edison and Consumers Energy would still have to.



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2011-2012 Highlights

Renewable Energy Plans

- Significant cost reductions due to:
 - Improved efficiencies of wind turbines (over 40% capacity factors compared to 28%-31% predicted in the original REPs)
- Less nameplate capacity needs
- Cheap Market RECs predicted
 - Approximately \$7/REC (\$0.007 per kWh)



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Consumers Energy's 2011 Biennial Plan U-16581

- Filed October 14, 2011
- Follow-up to February 24, 2011 Amended Plan
 - Reduced residential surcharge again from \$0.65 to \$0.52 (down from \$2.50 in 2009)
 - 3.25 MW EARP



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Consumers Energy's 2011 Biennial Plan U-16581

1. Cross Winds completion date modified from Dec. 2014 to Dec 2015
2. Expected capacity factor for Company-owned wind farms after Lake Winds to increase from 38% to 41%
3. MISO Wind Resource Adequacy Capacity increase from 8% to 12.9%
4. Expected capacity under the EARP to increase from 3 MW to 3.25 MW
5. Develop a solar program that will promote steady growth



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Consumers Energy's 2011 Biennial Plan U-16581

- Plan cost through 2029 reduced from \$5.2 billion in 2009 Plan down to \$3.1 billion
- Incremental cost of compliance (ICC) reduction from \$1.6 billion in 2009 Plan down below \$0.46 billion
- Annual ICC collection reduction from \$78 million in 2009 Plan down to \$24 million for the remaining 18 years of the plan period



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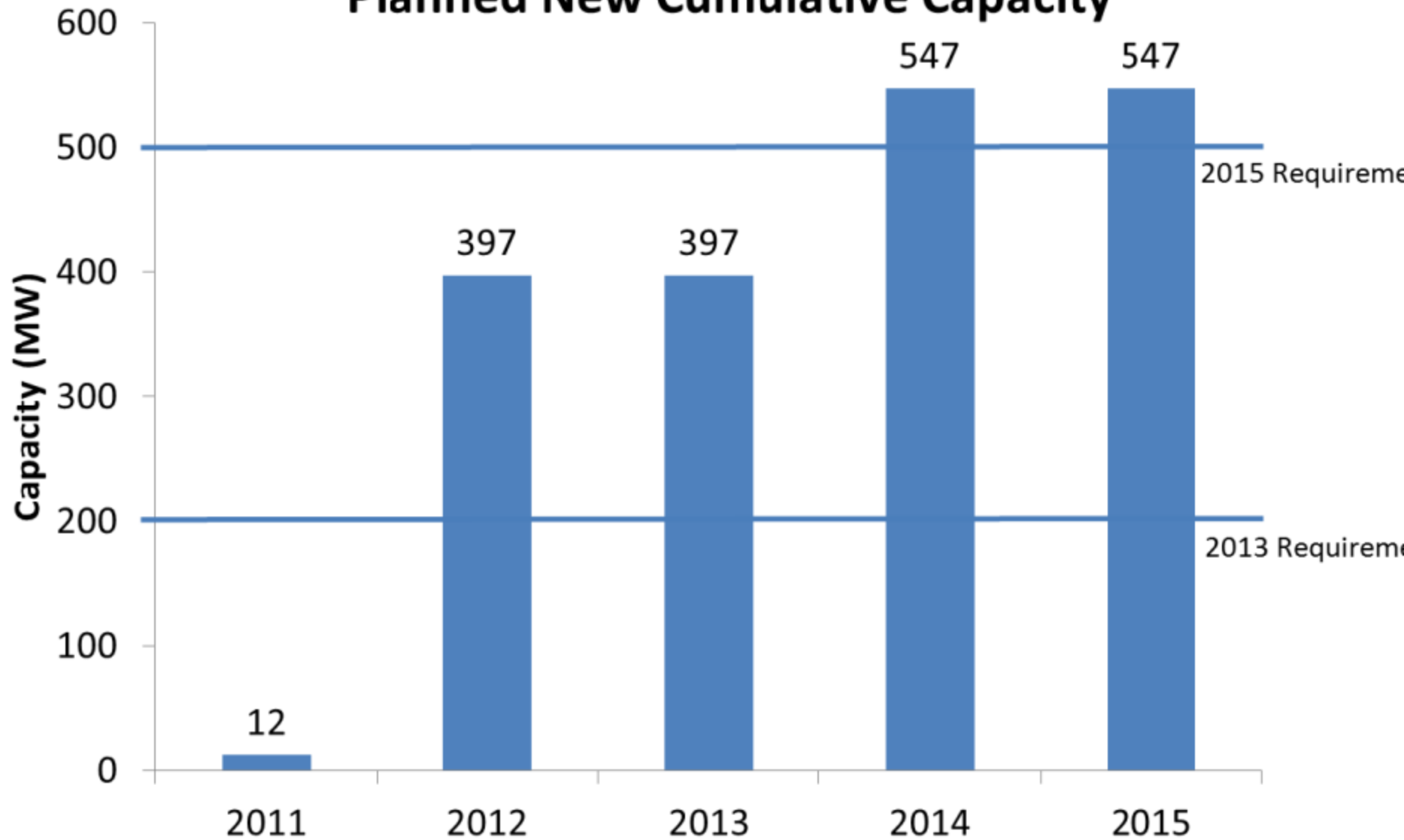
Consumers Energy's 2011 Biennial U-16581

- Company-owned needed capacity reduced from 450 MW in 2009 Plan down to 351 MW
 - The Company plans to build 3 wind farms:
 - 2012 - 100.8 MW Lake Winds
 - 2015 - 150 MW Cross Winds
 - 2022 - 100 MW TBA
- Purchase agreement capacity reduced from 463 MW in 2009 Plan down to 294 MW
 - Purchase agreements for the entire 294 MW have been executed
 - The Company has no plans to enter into any more purchase agreements
- Plan was approved May 1, 2012



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Consumers Energy Planned New Cumulative Capacity



Detroit Edison's 2011 Biennial Plan U-16582

- Filed June 2, 2011
 - Surcharges remain the same
 - Potential customer-owned SolarCurrents expansion



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Detroit Edison's 2011 Biennial Plan U-16582

- Plan cost through 2029 reduced from \$7.3 billion to \$6.1 billion but costs shift from PSCR to ICC
- ICC \$1.8 billion through 2029 down from \$2.3 billion in 2009
- Annual ICC of \$100 million



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Detroit Edison's 2011 Biennial Plan U-16582

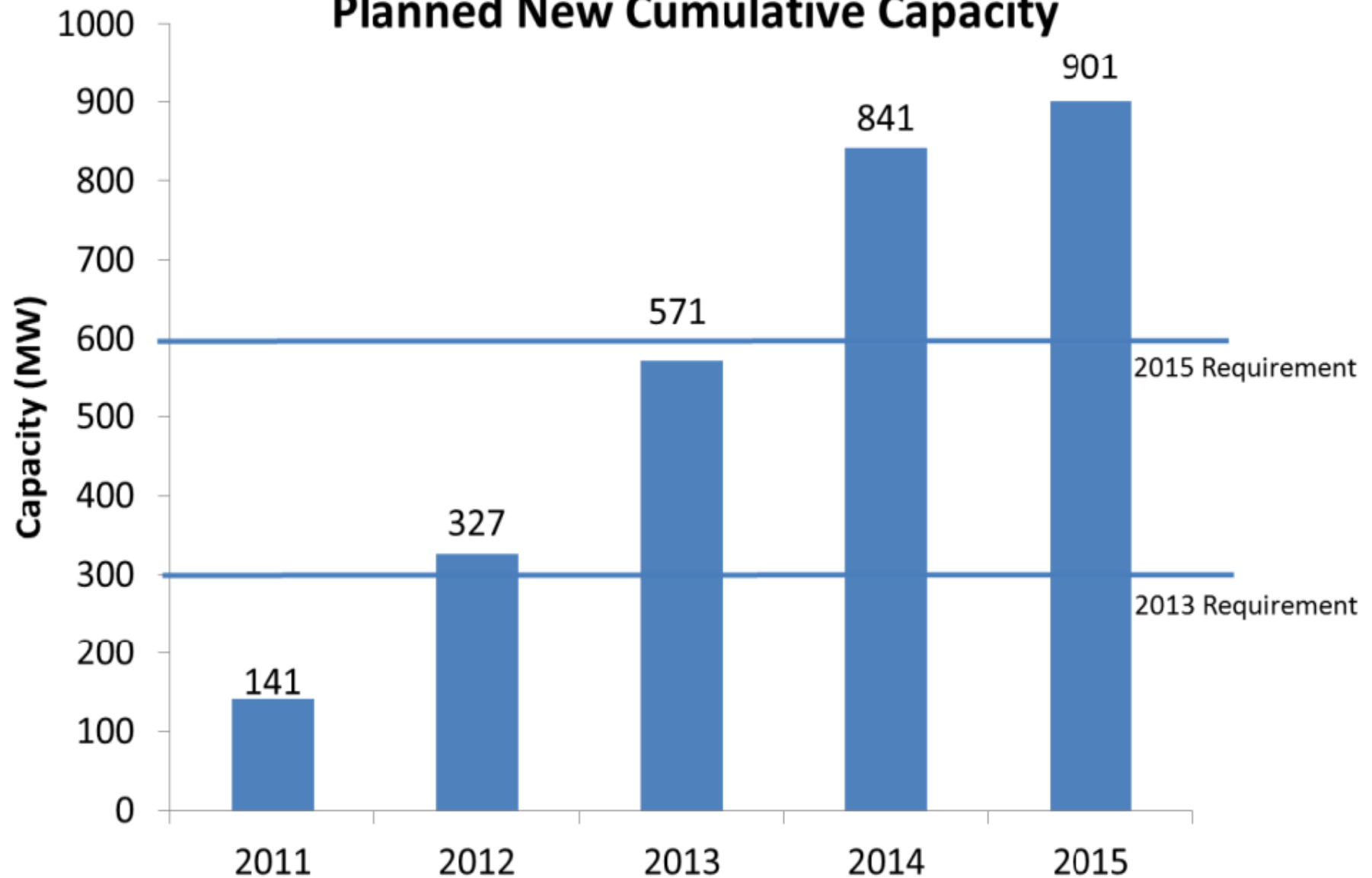
- Capacity reductions from 1295 MW down to 1000 MW
- Company owned capacity reductions from 609 MW down to 447 MW
- Purchase agreement capacity reductions from 686 MW down to 560 MW
 - 270 MW currently under contract
 - 100 MW solicitation in May 2012
 - 190 MW REC only/not yet solicited
- Plan Approved December 20, 2011



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Detroit Edison

Planned New Cumulative Capacity



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To learn more:

Renewable Energy Report under “Renewable Energy” at:

www.michigan.gov/mpsc

Consumers Energy 2009 REP _____ **U-15805**

Consumers Energy 2011 Amended REP _____ **U-16543**

Consumers Energy 2011 Biennial REP _____ **U-16581**

Detroit Edison 2009 REP _____ **U-15806**

Detroit Edison 2011 Biennial REP _____ **U-16582**

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